



REGULAR ARTICLE

CYANOBACTERIAL FLORA IN SOME SALT PANS OF PUDUKKOTTAI DISTRICT, TAMILNADU, INDIA

T. Nedumaran*, S. Manokaran

Center of Advanced Study in Marine Biology, Annamalai University, Parangipettai – 608 502, Tamilnadu, India.

SUMMARY

The present study was conducted diversity of Cyanobacterial flora in the salt pans of Kattumavadi, Prathaparamanpattinam, Manamelkudi and Ammapattinam located in Palk bay and Palk strait during the summer season 2008. A total number of 25 cyanobacterial species were collected 11 of Oscillatoriaceae 6 Chroococcaceae 5 Nostocaceae and 3 each of Scytonemataceae, Rivulariaceae and Stigonemataceae, Physico-chemical parameters were also studied.

Keywords: Cyanobacteria, Physico-chemical parameters, Salt pans.

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*Corresponding Author

1. Introduction

Cyanobacteria (blue green algae) are oxygenic photosynthetic prokaryotes widely distributed in the natural ecosystems of land, soil, freshwater, oceans, estuaries, saline back waters, estuarine salt lakes, salt marshes and also in hyper saline salt pans Fogg et al., (1973). Salt pans represent a series of inter-connected very shallow lentic water bodies with varying salinities. It is known that algae can grow in salt pans. In India, however, there are a few reports on algal flora of salt pans, although a number of publications are available on the occurrence of algae in brackish and marine waters (Thajuddin et al., 2002; Selvakumar & Sundararaman, 2007; Velankar & Chaugule, 2007; Reginald, 2007). In general, marine cyanobacteria in particular are

getting importance in the area of biotechnology (Bakus, 1991; Burja et al. 2001) the basic and fundamental requirements for initiating marine cyanobacterial biotechnology is first to enumerate the natural biodiversity and to understand their innate properties which could be useful for a variety of purposes. In the present study, the cyanobacterial biodiversity of salt pans in Pudukkottai district, Tamil Nadu in relation to the physico-chemical parameters were investigated.

2. Materials and Methods

Cyanobacterial samples were collected from the salt pans of Kattumavadi, Prathaparamanpattinam,

Manamelkudi and Ammapattinam located at the junction of Palkstrait and Palkbay. Samples were collected pouring 10 liters of hyper saline water in plankton net mesh size. 64 μ M and transferred to wide mouth polythene bottles and preserved in 5% formaldehyde. Identification was carried out by using the taxonomic publications (Biswas, 1926; Geitler, 1932; Desikachary, 1959; Anand et al., 1986 and others). The physicochemical parameters of waters samples were analyzed using the standard methods (Strickland & Parson, 1972).

3. Result and Discussion

The water sample showed variations in temperature, pH and salinity (Table 1). In four salt pans of Pudukkottai district, a total of 25 Cyanobacterial species were recorded of which 11 belonged family Oscillatoriaceae, 6 to Chroococcaceae, 5 Nostocaceae and 3 each to Scytonemataceae, Rivulariaceae and Stigonemataceae (Table 2).

Table 1. Physico – chemical parameters of some salt pans

Parameters	I	II	III	IV
Water Temperature ($^{\circ}$ C)	46	48	55	50
pH	8.2	8.1	8.5	8.1
Salinity (ppt)	49	60	95	73

I – Kattumavadi, II-Prathaparamanpatinam, III-Manamelkudi, IV-Ammappattinam.

Species belonging to Oscillatoriaceae were more as compared to Chroococcaceae, Nostocaceae, Scytonemataceae, Rivulariaceae and Stigonemataceae. Among the species observed Phormidium tenue Oscillatoria salina, Lyngbya aestuarii, Microcoleus lacustris were dominant as recorded by Velankar & Chaugule (2007) at Nalasopora Salt Pan Mumbai. Anand & Venkatesan (1985) reported 17 species of Cyanophyceae from the salt pans near Madras. Thajuddin et al., (2002), recorded 36 species of Cyanophyceae out of which none was heterocystous. Absence of heterocystous form was correlated with toxicity of high level of sulphites in the salt pans, whereas Oren & Shilo (1979), Stal et al., (1985) and Reginald (2007).

Table 2. List of Cyanobacteria in salt pans of Pudukkottai District

Name of the Family	Name of the Species	I	II	III	IV
CHROOCOCCACEAE					
	<i>Microcystis littoralis</i> (Hansg) Forti	+	+	-	+
	<i>Chroococcus turgidus</i> (Küetz.)Näg	+	+	+	+
	<i>Gloeocapsa aeruginosa</i> (Carm.)Küetz	+	+	-	+
	<i>Aphanocapsa littoralis</i> (Hansg)g.	+	+	+	+
	<i>Aphanotheca stagnina</i> (Spreng.) A.Br.	+	-	+	+
	<i>Synechococcus elongatus</i> Näg.	-	+	+	-
OSCILLATORIACEAE					
	<i>Phormidium ambigum</i> Gomont	+	+	-	-
	<i>P. fragile</i> (Meneghini) Gomont	+	+	+	+
	<i>P. tenue</i> (Meneghini) Gomont.	+	+	+	+
	<i>Oscillatoria salina</i> Biswas	+	+	+	+
	<i>Oscillatoria curviceps</i> Ag. ex Gomont	+	+	-	+
	<i>Spirulina major</i> küetz. ex Gomont.	+	+	+	+
	<i>Spirulina subsalsa</i> Oerst. ex Gomont.	+	-	+	-
	<i>Lyngbya aestuarii</i> Liebm. ex Gomont	+	+	+	+
	<i>Lyngbya confervoides</i> C.Ag.ex Gomont	+	+	+	+

	<i>Microcoleus lacustris</i> (Rabenh.) Farlow	-	-	+	-
	<i>Schizothrix friesii</i> (A.g) Gomont	+	-	+	+
NOSTOCACEAE					
	<i>Anabaenopsis circularis</i> (West) Woloszet Miller	+	+	-	+
	<i>Anabaena sphaerica</i> Born.et.Flahault	+	+	+	-
	<i>Cylindrospermum majus</i> Kütz.,	-	+	-	+
	<i>Cylindrospermum indicum</i> Rao, C.B.	+	+	+	+
	<i>Nodularia spumigena</i> Mertens, ex. Born et. Flah	+	+	-	+
SCYTONEMATACEAE					
	<i>Plectonema terebrans</i> Born. ex. Gomont	+	+	+	+
RIVULARIACEAE					
	<i>Calothrix crustacean</i> Thuret	+	-	+	+
STIGONEMATACEAE					
	<i>Hapalosiphon welwitschii</i> W. et. G.S. West	+	+	+	+

I – Kattumavadi, II-Prathaparamanpatstinam, III-Manamelkudi, IV-Ammappattinam.

+ - Present; Absent

References

- Anand, N. and Venkatesan, N, 1985. Seaweed Res. Utiln., 7, 101-103.
- Anand, N., Mohan, E. Hopper, R.S.S and Subramanian, T.D, 1986. Seaweed Res. Utiln., 9, 49-56.
- Bakus, G.J, 1991. An Indo-United states Symposium, pp.387-391.
- Biswas, K, 1926. Flora of the salt lake, Culcutta. J. Dept. Sci. Culcutta. Univ., 8, 1-57.
- Burja, M.A., Banaigs, E. Abou Mansour, Burgers, J.G and Wright, P.C. 2001. Tetrahedron, 57, 9347-9377.
- Desikachary, T.V., 1959. New Delhi. pp.686,
- Fogg, G.E, Stewart W.D.P, Fay. P and Walsby A.E. 1973. The Blue-Green Algae. Academic Press. London and New york. P.459.
- Geitler, L. 1932. Cyanophyceae. In: Rabenhorst's Kryptogamen flora. Leipzig, 1-1198.
- Oren, A and Shilo, M. 1979 Arc. Microbiol., 122, 77-84.
- Reginald, M, 2007. Studies on the importance of micro algae in solar salt production. Seaweed Res., Util., 29, 151-184.
- Selvakumar, K. and Sundararaman.M, 2007. Diversity of cyanobacterial flora in the backwaters of palk bay region. Seaweed, Res. Util., 29, 139-144.
- Stal, L. J., Van Germerden, H and Krumbein W.E. 1985. Structure and development of a benthic marine microbial mat. FEMS Microbiol. Ecol., 31, 111-125.
- Strickland, J.D.H and Parsons, T.R.A, 1972. Practical Handbook of Seawater Analysis, Bull. Fish Res. Bd. Canada., 167, 1-310.
- Thajuddin, N., Nagasathya, A, Chella devi, R and L. Saravanan, 2002. Biodiversity of cyanobacteria in different salt pans of Padukkottai District, Tamil Nadu. Seaweed. res. Util., 24(1), 1-11.
- Velankar, A.D and Chaugule, B.B, 2007. Algae of the salt pans of Nalasopara, Mumbai, Seaweed. Res. Util., 29, 273-278.